

EXECUTIVE SUMMARY

Our roads, bridges, and transit systems are the foundation of our surface transport system. Our 3.9 million miles of road, 581,000 bridges, 135,000 public transit vehicles, and their support infrastructure, are the result of decades of technical development and innovation, investment, and maintenance. The result of this sustained public commitment is a system that provides the reliability and service that we have come to expect, and on which we depend, to sustain economic performance, provide personal mobility, and help ensure national security. Our surface transport system has, in large measure, shaped the face of America. As we enter the 21st century and broaden our social and economic interaction with other nations in the global economy, the performance of our surface transport system will influence individual and corporate decision making. Sustaining transportation performance through investment and system management will complement other national efforts to improve productivity.

The U.S. surface transport asset base, and our reliance on it, is growing. National public road mileage has increased 1.3 percent since 1985, while highway travel has increased 36.5 percent. Congestion has increased as a result of this disparity but, with increased focus on system preservation, transport agencies have been able to mitigate most physical decay through aggressive pavement and bridge management systems and strategic investment. This is particularly true on higher classes of roads, including the National Highway System. With concerted efforts in driver education and seatbelt usage, elimination of roadside hazards, improvements in ride quality and road geometrics, and safety management, even in the face of this significant growth in highway travel demand, transport agencies have continued to reduce fatalities and crashes, although recent years have seen a stabilization in that trend.

The transit vehicle fleet increased 32 percent from 1985 to 1995 and similar expansions occurred in transit rail and bus capacities. This reflects the adoption by transit agencies of maintenance management strategies to prolong vehicle life. Highway travel growth exceeded transit travel over that period, but recent years have seen a moderation in highway demand and an increase in transit travel. State and metropolitan planning predict that this trend in highway demand moderation and transit travel increase will continue through the 1996-2015 analysis period covered by this report.

Condition and Performance - The amount of pavement in good and/or fair condition continues to increase, while poor pavement continues to decrease. This is particularly true on the higher order roadways, including the National Highway System. The number of deficient bridges has decreased since 1990. Highway safety continues to improve, but at a decreasing rate. These improvements reflect a continued shift in investment toward system preservation, development and deployment of pavement and bridge management systems, and emphasis on removal of roadside safety hazards.

Transit speed of service has increased over the past 10 years. About 80 percent of transit riders have wait times of less than 10 minutes. The condition of light rail equipment has improved, but there has been a slight decline in the condition of buses and heavy rail equipment. Condition of transit facilities, including power systems, stations, structures, and maintenance yards and facilities, continue to improve.

Highway congestion is a continuing problem, and potential decay in system reliability threatens to undermine other corporate and public efforts to improve national productivity. Highway peak-hour congestion has stabilized at a high level, but overall congestion, measured in density of use or hours of delay, continues to increase, and is occurring in more and more locations. Increases in delay add operating cost and inconvenience to users. More important, however, delay threatens system reliability, imposing risk and uncertainty on users and impeding industry's ability to adopt manufacturing and distribution strategies to control warehouse and distribution costs, thus enabling them to compete more effectively in the global economy.

Investment - Public investment in surface transport is at its highest level ever. In 1995, all units of government invested \$92.5 billion in highways and bridges, with \$43.1 billion of this devoted to capital improvements. All units of government invested \$16.5 in transit systems, with \$7 billion of this devoted to capital improvements. The surface transportation system is jointly funded by the Federal, State, and local governments, and the private sector. Each level of government has a different role in the improvement, maintenance and operation of the surface transportation system, and different methods for raising revenue.

Funding for highways and transit, which has exceeded inflation over the last 20 years, has not kept pace with inflation since 1993. The percentage of both highway and transit funding provided by the Federal government has risen since 1993. Since 1993 there has been a shift in the type of highway capital improvements made, towards preserving the existing system, and away from adding new capacity. For transit, this period saw a continuation of a shift from operating assistance to capital investment, including rolling stock and facilities.

Investment Requirements - Current system condition and performance provides a useful benchmark for system evaluation and analysis of trends over time. It is also a point of departure for analysis of investments that we must make to ensure system performance for future years.

In the tradition of previous reports, this version contains a maintain and an improve scenario each, for highways, bridges, and transit systems. The highway scenarios are developed using the Highway Economic Requirements System (HERS), a simulation tool introduced in the 1995 report. The HERS defines highway deficiencies and potential improvements through analysis of marginal benefits and costs. Transit scenarios are based on the Transit Economic Requirements Model (TERM), a new simulation procedure that applies benefit/cost tests to potential transit improvements identified on the basis of good practices in asset replacement and transit enhancement.

The two simulation procedures are similar in concept, but different in execution. Both procedures address investment analysis through the use of economic analysis, as directed by Executive Order 12893, "Principles for Federal Infrastructure Investments", published January 26, 1994. The bridge investment requirements, based on engineering assessment in this report, will be based on economic analysis in future versions. The transition to economic analysis is consistent with continued emphasis within transportation agencies toward value engineering, asset management, and greater cost-effectiveness in decision making.

The average annual cost to maintain highway user costs and bridge conditions for the period 1996-2015 is \$46.1 billion in 1995 dollars. The average annual cost to improve highways and bridges for the same period is \$79.6 billion. The actual 1995 total investment in pavement, highway capacity, and bridge improvements was 13 percent lower than the maintain scenario for that year. Highway and bridge investments could double and still provide user benefits that exceed costs. Any investment up to the improve scenario, referred to as the Maximum Economic Investment scenario, are estimated to yield marginal benefit/cost of greater than 1.0.

The economics based maintain highways estimate is lower than the engineering based estimate used in previous reports. The reduction is due primarily to a slight decline in the highway travel demand growth forecast used in the analysis and full incorporation of the 1994 Highway Capacity Manual, reflecting recent changes in driver behavior. Without these two factors, the maintain scenario would have remained much closer to the 1995 report estimate in constant dollar terms, even with the transition to an economics based approach.

The average annual cost to maintain transit conditions for the period 1996-2015 is \$9.7 billion in 1995 dollars. The average annual cost to improve transit conditions is \$14.2 billion. The maintain scenario for transit is higher than in previous reports because of a more comprehensive database of transit assets and better understanding of transit unit costs. The total 1995 capital investment in transit was 28 percent lower than the maintain scenario for that year. The improve transit scenario indicates that transit investment could also double and still provide marginal user benefits that exceed costs.

The investment analyses for both highways and transit require assumptions on future travel demand by mode. Highway travel forecasts assume a continuation in the moderation of highway demand. Transit estimates assume continuation of the growth in travel, which has occurred, in recent years. These assumptions reflect planning expectations of many of our larger urbanized areas, where environmental constraints, social and fiscal concerns, and adoption of demand management policies may result in improved travel demand management and encouragement of transit usage. These travel growth assumptions will influence both the surface transport investment requirements and the requirements for each mode to meet its service expectations.

The final section of this report focuses on the U.S. freight transportation system, including all modes of transport. This section provides an overview of the freight system through the use of modal profiles and provides a look at the forces of change that are or will impact freight providers as we move into a new century.